

Title of the Invention

PROTECTIVE METHOD USING PROTECTIVE GARMENT HAVING REVERSIBLE SHELL FOR MILITARY OR PARAMILITARY FIREFIGHTER

5 Cross-Reference to Related Application

This application is a continuation of United States Patent Application Serial No. 10/350,871, which was filed on January 24, 2003.

Technical Field of the Invention

10 This invention pertains to a protective garment for a firefighter or emergency worker, particularly a military or paramilitary firefighter or emergency worker. This invention contemplates that an outer shell of the protective garment is reversible so as to expose, as an outer surface, either an expansive surface of high visibility or an expansive surface of low visibility.

Background of the Invention

15 Protective garments for firefighters and emergency workers include coats, trousers, overalls, and coveralls. Currently, National Fire Protection Association (NFPA) standards require a protective garment for a firefighter to have reflective trim, which enhances the visibility of the protective garment and, therefore, the visibility of its wearer under smoke-laden and other adverse conditions.

20 Generally, reflective trim is affixed by sewing, adhesively, or otherwise.

However, for a military or paramilitary firefighter or emergency worker operating where a tactical operation has developed or is expected to develop, a need for low visibility may override a need for high visibility. Heretofore, a military or paramilitary firefighter or emergency worker may have to be issued two
25 types of protective garments, *i.e.*, protective garments to be worn in a tactical

operation, in which the need for low visibility overrides the need for high visibility, and protective garments to be worn otherwise.

Summary of the Invention

5 This invention provides a protective garment for a military or paramilitary firefighter or emergency worker. The protective garment has an outer shell, which has two expansive surfaces, and an inner liner. The expansive surfaces are comprised of a surface of high visibility and a surface of low visibility.

10 The outer shell is reversible so that, when the protective garment is worn, one said surface becomes an outer surface of the outer shell and the other surface becomes an inner surface of the outer shell. The inner liner is attachable detachably to the outer shell so as to be wearable within whichever of the expansive surfaces becomes the inner surface of the outer shell.

15 The outer shell has portions that are reflective, fluorescent, or both on the surface of high visibility but not on the surface of low visibility. Those portions may be provided by reflective trim affixed by sewing, adhesively, or otherwise to the shell, on the surface of high visibility. Preferably, when facing outwardly, the surface of low visibility appears black, or at least dark, in ambient light. Alternatively, when facing outwardly, the surface of low visibility displays camouflage.

20 Brief Description of the Drawings

25 Figure 1 is a front elevation of a protective coat embodying this invention and having an outer shell, which is reversible, as worn with an outer surface of the outer shell being of high visibility because of reflective trim. Figure 2 is a front elevation of the same coat, as worn with the outer surface of the outer shell being of low visibility.

Figure 3 is a similar view of the same coat, as illustrated in Figure 1, except that the coat is open so as to illustrate that an inner liner of the coat is detachable. Figure 4, on a larger scale, is a fragmentary cross-section taken along line 4—4 of Figure 3, in a direction indicated by arrows.

Figure 5 is a fragmentary detail illustrating that, in an alternative embodiment, the outer shell has two layers affixed to each other, as by sewing, one said layer providing a surface of high visibility because of reflective trim and the other layer providing a surface of low visibility.

Detailed Description of the illustrated Embodiment

As illustrated, a protective coat 10 for a military or paramilitary firefighter or emergency worker embodies this invention and has an outer shell 20 and an inner liner 30. The outer shell 20 has two expansive surfaces, which are comprised of a surface 40 of high visibility because of reflective trim 50 affixed by sewing, adhesively, or otherwise to the outer shell, on the surface 40, and a surface 60 of low visibility. The outer shell 20 is reversible so that, when the protective coat 10 is worn, one said surface 40, 60, becomes an outer surface of the outer shell and the other surface 40, 60, becomes an inner surface of the outer shell 20.

Preferably, as illustrated in Figures 1, 2, and 3, the outer shell 20 is made from a single layer of material, which appears black, or at least dark, in ambient light, except where reflective trim 50 is provided, or which displays camouflage, except where reflective trim 50 is provided. Alternatively, as illustrated in Figure 5, the outer shell 20 is made from two layers of material, which are affixed to each other by sewing, as illustrated, adhesively, or otherwise and which are comprised of a layer 70 having reflective trim 50 and providing the surface 40 of high

visibility and a layer 80 appearing black, or at least dark, in ambient light or displaying camouflage and, moreover, providing the surface 60 of low visibility.

Preferably, whether made from a single layer of material or from two layers of material, the outer shell 20 conforms to National Fire Protection Association

5 (NFPA) standards for outer shells of protective garments for firefighters. A preferred material for the outer shell 20, when made from a single layer, is Nomex™ material having a basis weight of nine ounces (9 oz.) per square yard, as available commercially from E. I. du Pont de Nemours and Company of Wilmington, Delaware. Such material is available commercially in patterns that
10 display camouflage. Such material having a combined basis weight of nine ounces (9 oz.) per square yard in two layers is useful for the outer shell 20, when made from two layers. Scotchlite™ reflective trim is suitable, as available commercially from Minnesota Mining and Manufacturing Company of St. Paul, Minnesota.

As illustrated in Figure 4, the inner liner 30 comprised a layer 32 defining a
15 moisture barrier and a layer 34 providing thermal insulation. Additionally, the inner liner 30 may comprise another layer or other layers. The inner liner 30 is attachable detachably to the outer shell 20, via snaps, buttons, zippers, hook-and-loop fasteners, or other known means, so as to be wearable within whichever of the expansive surfaces 40, 60, becomes the inner surface of the outer shell 20.

20 Although a protective coat is illustrated, this invention may be also embodied in other protective garments, such as trousers, overalls, and coveralls.

In a tactical operation, in which the need for low visibility overrides the need for high visibility, a military or paramilitary firefighter or emergency worker may wear the protective coat 10 with the surface 60 of low visibility facing
25 outwardly. Otherwise, the firefighter or emergency worker may wear the

protective coat 10 with the surface 40 of high visibility facing outwardly. If a tactical operation develops or is expected to develop while a military or paramilitary firefighter or emergency worker is wearing the protective garment 10 with the surface 40 of high visibility facing outwardly, the firefighter or
5 emergency worker may have an opportunity to doff the protective coat 10, detach the inner liner 20, reverse the outer shell 20, re-attach the inner liner 20, and redon the protective coat 10 with the surface 60 of low visibility facing outwardly.